

**Notice of Allowability**

Application No.

10/817,471

Applicant(s)

SUN ET AL.

Examiner

Mia M. Thomas

Art Unit

2624

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Applicant's Argument/Remarks made in an Amendment dated 15 November 2007.
2. ☒ The allowed claim(s) is/are 1-8, 16-19, 22-26, 35-39.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

Mia M. Thomas  
Patent Examiner  
Art Unit 2624

**DETAILED ACTION**

***Response to Amendment***

1. This Office Action is made responsive to the applicant's remarks received on 15 November 2007. Claims 1-42 are presently pending. Claims amended herein are 1,16,22 and 35. Claims 9-15, 20-21, 27-34, and 40-42 are cancelled. There are no new claims added herein. Applicant submits that the pending claims are allowable over the cited art of record for at least the reasons discussed during the interview.

***Petition for the Inclusion of Color Drawings***

**Petition Granted**

01 February 2008

2. Applicant respectfully request that color drawings be permitted in the above-captioned application as provided for by 37 CFR 1.84(a) (2) and (b)(2) and MPEP Section 608.02. Regarding instant application 10/817,471, the color drawings of record also include color photographs. Applicant submits that the most appropriate manner of illustrating such processing is to present actual color images.

Applicant has complied with the requirements set forth by 37 CFR 1.84(a)(2) and (b)(2). Applicant has submitted (3) Three sets of color drawings on double weight paper; an inclusionary statement in the first paragraph of the specification via proposed amendment to the specification; the necessary fee set forth in 1.17(h).

Art Unit: 2624

The Examiner of record now submits this written reply to the Petition for Review concerning this instant application and it is hereby granted for application (10/817,471) to enter color drawing and photographs by way of the Applicant's response to amendment.

***Response to Arguments***

***Drawings***

3. Applicant's Arguments---see page 14 paragraph [0010].

The drawings were received on 15 November 2007. These drawings were objected to by the Examiner, specifically Figures 1-13, 17-20. Applicant has submitted replacement drawings to correct the informalities and a petition to include color drawings. Applicant has also amended the specification to include the necessary statements regarding the inclusion of color photographs.

4. The new drawings have been accepted and the objection to these drawings has been withdrawn.

5. Applicant's Arguments---see page 15 paragraph [0012], with respect to Claim Rejections under 102 and/or 103 have been fully considered and are persuasive. In light of the formal amendments presented herein and the decisions reached during the Applicant initiated interview, the Examiner withdraws the rejections of claims 1-8, 16-19, 22-26, 35-39. The Examiner indicated that Claim 21 contain[ed] allowable subject matter. Independent claims 1, 16, 22 and 35 have been amended to incorporate the allowable subject matter of Claim 21. Additionally, independent claims 13, 30 and 32 have been cancelled. Examiner withdraws the rejection of claims 1-8, 16-19, 22-26, 35-39 and allows the pending claims.

***Allowable Subject Matter***

1. Claims 1-8, 16-19, 22-26, 35-39 are allowed.
2. The following is a statement of reasons by the Examiner for the indication of allowable subject matter:

Independent Claims 1 and 22 are drawn to a method and a computer readable media interpolating the low-resolution image to provide a low-frequency image prior to the extracting; combining the high-frequency primitive layer with the low-frequency image to provide an intermediate image; and reconstructing the intermediate image by applying back projection to provide a high-resolution image, wherein the back projection is provided as follows:

$$\underline{I_H^{t+1} = I_H^t + (((I_H^t * h) \downarrow s - I_L^t) \uparrow s) * p}$$

where p is a back projection filter;  $I_H^t$  and  $I_H^{t+1}$  are input image and output images at times t and t+1; h is a blurring operator determined by the point spread function of the imaging sensor;  $\uparrow s$  is an up-sampling operator by a factor S and  $\downarrow s$  is a down-sampling operator by a factor s.

Art Unit: 2624

Independent Claims 16 and 35 are drawn to a method and apparatus (which has means plus function language) that describe

( $I_H$ ), wherein the reconstructing applies backprojection to the intermediate image ( $I_H^t$ ) to provide the high-resolution image ( $I_H$ ), wherein the backprojection is provided as follows:

$$I_H^{t+1} = I_H^t + (((I_H^t * h) \downarrow_s - I_L) \uparrow_s) * p$$

where  $p$  is a backprojection filter;  $I_H^t$  and  $I_H^{t+1}$  are input image and output images at times  $t$  and  $t+1$ ;  $h$  is a blurring operator determined by the point spread function of the imaging sensor;  $\uparrow_s$  is an up-sampling operator by a factor  $s$ ; and  $\downarrow_s$  is a down-sampling operator by a factor  $s$ .

The closest prior art made of record with regards to the rejections set forth in the last Office Action (35 USC 102 and 103) includes:

- Freeman      US Patent 6,766,067
- Guo- Non Patent Literature      "Towards a Mathematical Theory of Primal Sketch and Sketch-Ability"
- Freeman- Non Patent Literature      "Learning Low Level Vision"
- Freeman      US Patent 6,263,103

Art Unit: 2624

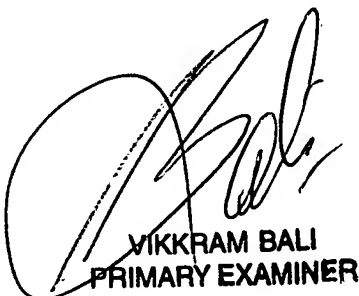
**Conclusion**

Any comments considered necessary by Applicant must be submitted no later than the payment of the issue fee and to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mia M. Thomas whose telephone number is 571-270-1583. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



VIKKRAM BALI  
PRIMARY EXAMINER

Mia M Thomas  
Examiner  
Art Unit 2624

